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AUTHOR Wedman, John; Strathe, Marlene I.
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ABSTRACT

The Faculty Development in Computers Project (FDIC) at the University of Northern Iowa creates an on-going support structure for faculty involved in the process of incorporating computer technology into their personal and professional activities. Specifically, the FDIC facilitates development of broadly defined computer literacy among teacher educators through a differentiated delivery system model and correspondingly monitors faculty development through a change based mode. The FDIC Project is based on a synthesis of conceptualizations of the change process, adult learning, and faculty development. The project model is organized along three dimensions. One dimension represents the individual level of concern about computer technology (awareness raising and information gathering; exploration and preparation; implementation; and collaboration and innovation). The second dimension represents major contexts in which a faculty member may apply computer technology (instructional, creative, management, or personal). The third dimension represents the various levels of organizational structures in which the FDIC interventions can be operationalized (individual, group, department, or college level). Also discussed in this report concerning FDIC are: (1) relationships among dimensions; (2) interventions: intentional and incidental; and (3) project evaluation. (JMK)

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Computer Literacy for Teacher Educators:

A Prerequisite for the 21st Century

John Wedman
Coordinator, Faculty Development
in Computers Project
College of Education
University of Northern Iowa
Cedar Falls, Iowa 50614
(319) 273-2795

Marlene I. Strathe
Director, Educational Research
and Development Center
College of Education
University of Northern Iowa
Cedar Falls, Iowa 50614
(319) 273-6052

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Computer Literacy for Teacher Educators:

A Prerequisite for the 21st Century

Hall, George, and Rutherford (1977) point out that "Understanding and describing the process of change in educational institutions, while at the same time maintaining sight of the individual, is a challenging task for managers of the change process, as well as for change researchers." Their observation, fundamental to the process of developing faculty development programs which focus on technological innovations, is particularly significant when the innovation involves computer technology. While programs designed to develop "computer literacy" (however defined) for adult learners currently abound, these programs are typically based primarily on conceptualizations of the content to be included rather than taking into account the unique characteristics of the adult learner and the type and intensity of the learner's concerns about the technology. One key question in relation to the development of computer literacy for higher education faculty is how to link the current knowledge bases of adult development, faculty development, and change processes with computer literacy content. The project to be described today reflects an attempt to apply what research has revealed about these areas to the development of computer literacy among a teacher education faculty. In order to provide a better understanding of the underlying theory bases of the project, a brief review of the salient research will be presented. Following the literature review, the faculty development model that has evolved out of the project will be described and elaborated on. Descriptive data will be offered showing how individual faculty members might change during this particular faculty development process.

LITERATURE REVIEW: Adult Development.

As noted by Bergquist and Phillips (1975), "The processes of change, as they involve any person or institution, are always subtle and ill defined." The literature relative to adult development theory and research indicates that change for the individual is highly personalized and dependent in large measure upon the life stage of the person (Cytrynbaum, Lee, Wadner, 1982). While numerous authors have differed slightly in identifying age-specific stages of adult development, generally adults within the university community may be characterized as in early entry and career stabilization, midlife development, or senior life stages.

The early entry and career stabilization stage is characterized as one in which the individual seeks to identify his/her own position within the institution and to establish one's self as a professional. These younger faculty members have often had limited teaching experience at the post secondary level, and while they may value instructional innovation and improvement, without tenure and having limited power and influence, their willingness to risk instructional change is often limited. Their major concerns center around research, publication, and instructional competence, all necessary if they are to achieve tenured status.

The midlife development stage is characterized as one in which adults, having achieved a degree of professional security, reassess their personal and professional lives. Cytrynbaum (1980) has described this stage as one in which personal and professional withdrawal may occur and enthusiasm for innovation may be lacking. Their concerns and needs may be more personal than organizational. While previously acting as effective mentors for younger faculty members, this "fallow" period may be marked by their withdrawal of mentoring support and in some cases their resistance to instructional change.

The senior life period is one in which faculty members prepare for retirement and have usually resolved the issues of the midlife stage. Often adults during this period return to active participation and support of institutional change. As noted by Erickson (1968), many wish to pass on to the new generation the lessons they have learned. The needs and concerns of this age group are primarily centered on how they can meaningfully continue to participate in the institution.

Given this brief overview of adult development as viewed from the perspective of higher education faculty, we see that faculty development efforts must recognize the various stages of adult development within a faculty. Centra (1980) has projected that by 1990 almost half of all tenured faculty members will be between 56 and 65 years of age. Thus, the changing composition of teacher education faculties is an important variable in the development of an ongoing faculty support system for change related to educational technologies. An effective development program must acknowledge that the adult learner is a self-directing human being, that his/her readiness to learn is a function of the adult's perception of the role tasks for which he/she is responsible, and that learning which is personally problem centered rather than content centered is most meaningful for the adult learner.

LITERATURE REVIEW: Faculty Development.

Bergquist and Phillips (1975) state that "an effective faculty development program must contain components that have immediate face validity, this is, have specifically to do with the primary function of the faculty member." Given that faculty members at various stages in their lives perceive their primary function/role differently, faculty development programs must be based on diverse strategies. Eraut (1978) noted that faculty development programs cannot be successful unless (a) some sense of dissatisfaction exists, (b) resources are directed

specifically toward change, (c) guidance is given to developing a comfortable level of usage, and (d) individuals are aware that a change is likely to meet their own personal or professional needs.

Faculty development programs which focus exclusively on the development of computer literacy for instructional purposes fail to recognize the research, publication, and information management needs of many faculty members. These needs serve equally well as a context for the development of computer literacy. The faculty development literature would suggest that when faculty members receive information or training in less threatening and more personally relevant areas, he/she will be more inclined to accept information relevant to other areas which are of lesser concern. For example, a faculty member who is primarily involved in several research and development projects and limited teaching will be more open to information about using computer technology for data analysis and information management and less open to information about using computer technology as an instructional delivery system.

LITERATURE REVIEW: Change Process.

The work of Loucks, Hall, and others at the R & D Center at the University of Texas provides an important link for identifying concerns of individuals relative to an innovation and monitoring changes in those concerns as a result of development programs. They have developed the Concerns Based Adoption Model (CBAM) which stresses the recognition that change is a personal process and change efforts are most likely to be effective when individuals see themselves as more important than the change itself. The CBAM model also recognizes that individuals change in the types of concerns which they express relative to an innovation and thus, differentiated development programs may be most effective in meeting those varying concerns. The CBAM model identifies concerns such as

personal, management, and collaboration which require very different types of development efforts.

LITERATURE REVIEW: Conclusion

The Faculty Development in Computers Project at the University of Northern Iowa was designed on the basis of the previously presented information. The purpose of the project, referred to as the FDIC project, was to create an on-going support structure for faculty involved in the process of incorporating computer technology into their personal and professional activities. Specifically, it was the intent of the project to facilitate development of broadly defined computer literacy among teacher educators through a differentiated delivery system model and correspondingly to monitor faculty development through a change based model.

FDIC Project Overview

The FDIC Project is structured on the premise that an effective faculty development program is a comprehensive change effort involving individual faculty members, department and college level administration and structures, and faculty development program support personnel and resources. The FDIC Project design is intended to facilitate desired, long-term change in the professional and personal behaviors and attitudes of faculty. The Project model recognizes that change is a developmental process, both cognitively and attitudinally.

The FDIC Project model is targeted primarily at the individual faculty member rather than larger, organizationally defined units (e.g., departments, divisions). Consequently, the effectiveness of project interventions are indicated by individual responses to computer technology. Approximately 200 College of Education faculty at UNI are the potential benefactors of the project.

The scope of the FDIC Project interventions varies, depending on the nature of the interventions. Some interventions (e.g., newsletters) lend themselves to broad distribution. Others (e.g., consulting) are more suitable to limited distribution.

The FDIC Project is designed to be an ongoing, but finite process, continually evolving to better meet the needs of individual faculty members as they encounter computer technology. At the same time, there are elements of the project that will ideally provide for the withdrawal of the support structures allowing the faculty to become more self-supporting.

PROJECT STRUCTURE

As discussed earlier, the FDIC Project is based on a synthesis of conceptualizations of the change process, adult learning, and faculty development. Bergquist & Phillips (1975) and Hall (1975) were particularly influential. Bergquist & Phillips argued that significant change in faculty must take place at three levels: personal attitudes, instructional process, and organizational structures. They suggest that a change effort focusing on only one of these levels will rarely achieve success. Hall pointed out that the reason for so little meaningful change in education is that the focus of change has been to add things (e.g., new curricula, new organizational structures). Hall argues that the focus of change should first be on the individuals that must make the change. System level change, Hall states, will not be accomplished unless individual members are attended to. Particularly, attention must be directed toward the concerns the individuals have about the desired change.

Both the Bergquist & Phillips model and the Hall model offered guidance as we began to organize the faculty development effort for College of Education faculty. However, neither model seemed to fit all of our development needs. Hall's approach had been to concentrate on one particular innovation. Such an

approach seemed inappropriate given the many contexts in which computer technology manifests itself today. Bergquist & Phillips said that the instructional development component of a faculty development effort is of primary concern. This emphasis on instructional improvement was problematic. First, as with Hall, Bergquist and Phillips' approach did not readily allow for the various contexts in which computer technology is found. Second, some faculty do not view themselves as primarily being instructors. A new model was needed which incorporated the basic concepts of Hall and Bergquist and Phillips, but overcame the above limitations. The FDIC project model was created to provide a structure for planning and monitoring intentional interventions and, at the same time, for placing unintential, but significant, events within the overall faculty development effort. The project model was organized along three dimensions. One dimension represents the level of concern an individual has about computer technology. The second dimension represents the major contexts in which a faculty member may apply computer technology. The third dimension represents the various levels of organizational structures in which the FDIC interventions can be operationalized. The overall structure of the model is shown in Figure 1.

INSERT FIGURE 1 ABOUT HERE

DISCUSSION OF THE CONCERN DIMENSION

The first dimension to be considered is the "Concerns Dimension". This dimension refers to the affective component of change and is essentially a collapsed version of Hall's Stages of Concern. Hall describes seven distinct stages through which an individual progresses as he/she uses an innovation, particularly an educational innovation. These seven stages were collapsed into four

stages for reasons which were more practical than conceptual. We have maintained more than a passing link with the Stages of Concern in that we use the Stages of Concern Questionnaire as one device for monitoring the overall change process.

The Concern Dimension consists of four stages:

Stage One. Awareness Raising and Information Gathering

Stage Two. Exploration and Preparation

Stage Three. Implementation

Stage Four. Collaboration and Innovation

The stages are considered to be developmental in nature and therefore somewhat sequential. However, movement into a higher stage does not mean that an individual no longer has access to or need for the support initiated in previous stages. The identification of stages helps prescribe and sequence FDIC activities. The stages can be better understood by generally describing the individuals and interventions found at each stage.

State One: Awareness Raising and Information Cathering.

An individual at this stage can be characterized as being curious but cautious about computer technology. The individual does NOT want to be directly involved with the technology; direct involvement would be viewed as threatening. Rather, an individual at this stage wants to view computer technology from a safe distance. Thus, Stage One interventions are primarily concerned with overcoming the inertia that tends to prevent change, in this case, change involving computer technology. Relevant information about computer technology is presented in a nonthreatening manner with no attempt being made to secure the individual's committment to further involvement.

Stage Two: Exploration and Preparation.

Faculty members at this stage are involved in the process of actively exploring various computer related topics and applications, eventually committing to more restricted, but indepth concentration on a specific aspect(s) of computer technology. Thus, Stage Two interventions are concerned with introducing and developing the computer related skills an individual perceives as being potentially rewarding, personally and/or professionally. For example, an individual at Stage Two might spend a few hours with an FDIC consultant learning a few general procedures for using a microcomputer before borrowing a college owned microcomputer to take home over the weekend for the "kids to play with". Whereas the Stage One individual would typically view computer technology in a non-committal manner, the Stage Two individual would exhibit more personal involvement with computer technology (e.g., self-selected learning opportunities).

Stage Three. Implementation.

Stage Three concerns arise after the individual has acquired general skills in a few, self-selected computer applications and has resolved most lower level concerns about computer technology. At this stage, the individual is ready for training and/or support in a particular application of computer technology. The individual's concerns are in the areas of acquiring resources available to implement a computer related activity (e.g., How will the hardware required to deliver computer based instruction be acquired?), managing a computer related activity (e.g., How is a research project involving computer technology organized?) and anticipating the consequences of computer related activities (e.g., How will computer technology improve the information flow in an organization?). While complex, these concerns often manifest themselves on a very small scale. For example, an instructor may decide to include a

two-day unit on computers in an Instructional Media course. Only after a degree of success has been achieved will the individual attempt to implement projects on a larger scale. Stage Three interventions often involve linking the individual client with someone having considerable experience in a particular application.

Stage Four. Collaboration and Innovation.

Stage Four concerns are found among individuals who have achieved a high level of use of computer technology and who are interested in discovering or developing new or improved uses for computer technology. Concerns at this stage would be found among those who have a wide variety of computer related skills as well as for those who have considerable expertise in a few specific applications. A classic example of a Stage Four concern can be found among a group of faculty planning a "computer conference". Their need for interaction with others involved in computer technology has become a driving force in their daily activities. Stage Four interventions are intended to help facilitate collaboration by linking practicioner with practicioner and to help promote innovation by directing attention toward individuals involved in innovative applications of computer technology.

Taken collectively, the concerns dimension could serve to describe the change process as it relates to a given innovation, in this case computer technology. However, computer technology is not an innovation without a context for application. As the FDIC Model began to emerge, it soon became evident that computer technology is, in a certain sense, defined by its application. The context for the application in effect determined the cognitive component, or dimension, along which the FDIC Project was developed.

DISCUSSION OF FACULTY CONTEXT DIMENSION

The elements of this dimension represent the four major contexts in which

a faculty member is likely to encounter computer technology:

1. Instructional Context
2. Creative Context
3. Management Context
4. Personal Context

Other contexts were not included in this dimension but could readily be added to the model if a relationship between these contexts and faculty activities became common.

Instructional Context.

The focus of the instructional context is on the use of computer technology in the instructional process. The instructional context includes instructional planning, instructional preparation (e.g., materials generation), and instructional delivery. Since the FDIC Project is targeted at College of Education faculty, the instructional context includes both proximate situations (e.g., use in instruction delivered by college faculty) and remote situations (e.g., use in instruction delivered by inservice teachers). FDIC interventions relative to this, or any context are designed in light of both the context and the concerns.

Creative Context.

The creative context includes research, publication (both print and nonprint), and consulting. The focus of the creative context is on computer technology as an "assistant" or "tool" in the creative process and on computer technology as an "object" in a creative activity. For example, computer technology can be a research tool when it analyzes data or a research object when used as a variable in a research effort. It is important to realize that an individual may be quite experienced in the instructional applications of computer technology and be a novice in the creative applications. Consequently,

it is conceivable that concerns will vary from context to context.

Management Context.

The Management Context entails such activities as academic advising, program coordination, and other tasks involving information storage and retrieval tasks. Even though electronic spread sheets and data base management systems have their electronic roots in the same technology as statistical packages or instructional courseware, they are functionally quite different from each other. One of the lessons learned early on in the FDIC Project was to avoid the use of powerful computer based management systems as examples to show faculty the utility of such a system, even those faculty who were experienced in instructional computing. In other words, the information presented to faculty members had to be 1) appropriate to their stage of concern; 2) in a context the faculty member was interested and involved in; and 3) presented in a simplified form prior to an elaborated, complex form.

Personal Context.

The Personal Context was added to the FDIC Model in response to a growing number of requests from faculty members who found themselves in the market for a personal computer. The context has grown to encompass personal finance (e.g., tax laws and personal computers), and family and ethical problems associated with computer technology (e.g., computer games, software piracy).

Other application contexts could potentially be added to the model. For example, we have considered adding a "technical context" for those faculty members who take great delight in the inner workings of computers and computer languages. The point to consider here is that additional contexts immediately add breadth to the development effort. Given limited resources, additional contexts tend to dilute the overall effort. The organizational dimension was added partially in response to the suggestions found in the literature on faculty

development and partially in response to the need for a means of reaching more faculty with limited faculty development resources.

DISCUSSION OF ORGANIZATIONAL DIMENSION

The elements of the Organizational Dimension represent the various levels of institutional structures in which the FDIC Project can have impact. The individual faculty member constitutes the first and primary level of this dimension. The FDIC Project is focused on the individual; all interventions are planned and evaluated in light of the net effect on the individual involved. At the same time, it is recognized that individuals function in a variety of groups, both formal and informal.

The second level of this dimension is the group level. Groups include informal work groups (e.g., writing groups), curricularly defined groups, and committees. Since most faculty members readily move from the individual level to the group level and back, the project frequently uses formal and informal groups as vehicles for reaching individuals. Such an approach has a unique advantage in that established groups can be easily called together for a computer related demonstration, discussion, or workshop (since groups typically have established meeting times).

The next level of the Organizational Dimension is the department. At the departmental level the role of the FDIC Project becomes more like a program development effort than a faculty development effort. However, the focus remains on the individual faculty member. For example, an FDIC effort might be to help a department establish a departmental wide "computer literacy for preservice teachers" curriculum. The FDIC interventions at the departmental level are concerned with both coordination of computer related projects within a department and implementation of any particular departmental project.

On the college level, the FDIC Project functions as a coordination agent, helping to facilitate computer related activities that cut across departments. For instance, the FDIC Project may be given the responsibility of recommending allocation of college dollars for computer hardware. Another example might involve securing college level support and recognition for individuals involved in computer related activities (e.g., develop a position statement addressing the issue of "electronic publication"). The success of the FDIC Project is contingent upon the commitment of the departments and the college to the faculty development process. Involvement on the part of individuals must be paralleled by perceived involvement on the part of the various administrative structures within the college.

RELATIONSHIPS AMONG DIMENSIONS

The dimensions of the FDIC Project are related through the interplay of the elements from each dimension forming the 64 cells of the model. However, there are too many combinations to allow for a discussion of each interaction. The relationship among the three dimensions are best described in light of the functions performed by the model. These functions are:

1. to operationally conceptualize the FDIC Project.

2. to design specific faculty development interventions based on the identified needs.

3. to organize the monitoring and recording of specific faculty development efforts.

4. to provide a framework for integrating intentional interventions with unintentional but significant events (ancillary learning if you will) that relate to faculty development in computer technology.

For a cell to be "identified as functional", much like the cells of a battery are charged, three inputs must be present, one from each dimension. The

organizational dimension input is the simplest to create. First of all, the "individual" is the default level for this dimension. If another level is selected for an intervention, the intervention must be so designed that there is a personalized component. For instance, a Direct Response Form is included in each issue of the faculty development newsletter. The form provides the reader the opportunity to request services or information mentioned in the newsletter. Thus, identifying the appropriate level along the organizational dimension is primarily a task of selecting the highest level at which an intervention can maintain some sort of link with the individual and still be effective.

The context dimension input is normally based on the context(s) identified as appropriate for individuals or groups. Contexts are identified through a variety of means. Surveys have been used to initially determine global information needs and interests. Personal contacts are sometimes used to refine information needs. Additional contextual information has been obtained by monitoring which faculty development events and services are attended or used by an individual, giving us insight into the contexts which seem relevant to that person.

The concerns dimension input is the most critical element to create. The Stages of Concerns Questionnaire is used to formally assess individual's concerns about computer technology. The SoCQ evolved out of the Concerns Based Adoption Model which hypothesizes that individuals move through different stages of concern as they gain more experience with an innovation. The hypothesized stages are shown on the next page.

Definitions of Stages of Concern About the Innovation.

Stage	Title	Definition
0	Awareness	Unconcerned about the innovation.
1	Information	Concerned about the general characteristics of the innovation
2	Personal	Concerned about the relationship between one's role and the demands of the innovation.
3	Management	Concerned about the time, organization, and management of the innovation.
4	Consequences	Concerned about the impact of the innovation on student outcomes.
5	Collaboration	Concerned about working with others using the innovation.
6	Refocusing	Concerned about something better than the innovation.

The seven stages of concern were collapsed to form the four levels found in the FDIC model. Stages 0 and 1 formed our Awareness Raising and Information Gathering stage. Stage 2 became our Exploration and Preparation stage. Stages 3 and 4 were combined to become our Implementation stage. And Stage 5 and 6 were combined to form our Collaboration and Innovation stage. As mentioned earlier, our decision to collapse the seven Stages of Concern into four stages was more practical than conceptual. When it became obvious that the FDIC model was necessarily three dimensional, the number of combinations possible with 7 stages along the concerns dimension was simply more than we cared to deal with. However, we continued to use the SoCQ as a monitoring instrument.

The SoCQ is scored using the SoCQ Quick Scoring Device (Hall, 1978). The Quick Scoring Device converts raw scores to percentile scores for each stage of

concern. A higher percentile score is associated with greater concern intensity for a particular stage.

In reference to interpreting SoCQ results, Hall & Rutherford (1975) suggest that "due to the nature of the questions being asked, identification of trends and patterns in the data seems more valid than conducting a series of tests of statistical significance." Following their suggestion, individual graphical representations of the SoC percentile scores were created. The graphical representation is referred to as a "concerns profile." The concerns profiles were then interpreted for trends and patterns. Finally, the data for all faculty completing the questionnaire was combined to create a total group concerns profile which was also interpreted for trends and patterns.

DISCUSSION OF SoCQ PROFILES

The dominant pattern found among faculty members was that of a nonuser.

INSERT FIGURE 2 ABOUT HERE

The CBAM predicts that Stage 0, 1, and 2 concerns will be most intense when the individual has had little experience with the innovation. Concerns at other stages (3 thru 6) will be less intense until the individual gains experience with the innovation, in this case, computer technology. Anecdotal data suggested that, with few exceptions, most faculty members were relatively new to computing. For most, their last extended interaction with computers occurred during their graduate study.

A few faculty members' profiles were quite different from the norm. For example, among those faculty who had been involved in computing activities on an ongoing, regular basis, the typical profile was similar to the one shown in Figure 3.

INSERT FIGURE 3 ABOUT HERE

Here we see lower concerns in the areas of awareness information, personal, and management and increased concerns in the areas of collaboration and information. It seems as though computer users frequently want to know more and want to talk to others about what they know. The data generated by the SoCQ provided the final input required to identify functional cells.

Before continuing it should be noted that the initial mailing resulted in only a 35% return rate. This was about average among the UNI faculty when they receive a survey from a colleague. While we were able to begin our faculty develop efforts with this limited information, we could not accurately tailor individual interventions for those who had not responded. Our approach to obtaining this data has been to include the SoCQ as a part of any "first contact". For example, if a faculty member asks to reserve a micro-computer for a weekend, a check is done to determine if a Concerns Profile is available for that individual. If not, the faculty member is asked to complete a SoCQ before checking out the micro-computer.

A second, less reliable means of collecting concerns data is by observing the type of information requests a faculty member makes. For example, at a recent planned informal discussion on the topic of "Buying a Home Computer" a faculty member commented that he really wasn't interested in how to rearrange his home office to accommodate a personal computer; he just wanted to know how a personal computer might help him with his consulting business. Clearly, his concerns were at the personal stage rather than the management stage. Translated into the FDIC model, this individual would probably be in the exploration and preparation stage.

At this point SoCQs have been centered on identifying the concerns of individuals about the instructional applications of computer technology. Preliminary investigation using a modified version of the instrument indicates limited congruency between an individual's concerns profile for instructional applications and the same individual's concern profile for other contexts. Rather than multiplying our data collection problems by attempting to collect concerns data for all individuals in all contexts, we are planning to collect concerns data for individuals based on the primary context in which he/she will most likely view computer technology as being personally relevant. This approach is consistent with the intended purpose of the project, to create an ongoing support structure for faculty involved in the process of incorporating computer technology into their personal and professional activities.

To recap, three inputs must be present for a cell to become functional: a relevant context, an identified stage of concern, and a link from an organizational structure to the individual. Once a cell becomes functional, interventions can be designed and implemented. The next portion of this presentation will focus on selected interventions and events. The model serves to organize these efforts, thus avoiding the "spray and pray" appearance of some training and development projects.

INTERVENTIONS: INTENTIONAL AND INCIDENTAL

Faculty development interventions are normally considered to be intentional events designed to facilitate change. However, a comprehensive faculty development project must not be so myopic that it fails to consider those significant but unintentional events that occur outside the plans of the project and impact those individuals who are the project targets. These incidental interventions can be so significant that they virtually overshadow a host of well planned events. Case in point. Last spring almost 100 faculty at UNI participated in a

group purchase of Apple//e microcomputers. This one event, well outside of any planned faculty development effort, had a tremendous positive effect on the overall attitude of individuals towards microcomputers. Unfortunately, just a few weeks later Apple Corporation stock began to fall and questions were raised about the future of the company. Attitudes again shifted, especially among those who had just purchased their first micro. The FDIC Model is open enough to allow for the recognition of such unintentional interventions. However, a number of intervention vehicles have been utilized to supplement, and sometimes offset, the many unintentional interventions so common in an area changing and expanding as rapidly as computer technology.

Intervention vehicles are the means through which the FDIC Project achieves its goals. The vehicles can be roughly classified as:

1. General information vehicles.
2. Resource linking vehicles.
3. Problem solving vehicles.
4. Resistance countering vehicles.

**General information vehicles are designed to discriminate common information to a widely diverse audience. Newsletters, video tapes, and 'come if you're interested workshops' are examples of general information vehicles.

**Resource linking vehicles are designed to provide tailored information and/or services to better meet individual's needs. Copies of relevant journal articles, in office consultation, and requested demonstrations are examples of resource linking vehicles.

**Problem solving vehicles are designed to generate solutions to the instructional, management, creative, and personal problems that are in some way related to computer technology. Aiding in the development of a computer based testing system, implementing a data management system, and providing help in operatin

a new microcomputer based word processing system are examples of problem solving vehicles.

**Resistance countering vehicles are designed to bring about change by overcoming or countering resistance. Having a skeptical nonuser of computer based instruction to constructively review courseware developed by a colleague (with the colleagues permission) is an example of a resistance countering vehicle.

The use of these vehicles within the parameters of the FDIC model can be seen in the various interventions generated by the project. A few examples of interventions will serve to give you a flavor for various FDIC activities. Let's begin with a look at interventions appropriate for individuals with stage one concerns.

The CBAM model, as modified to fit the FDIC model, tells us that faculty who have stage one concerns will resist attempts to seek a commitment to become involved with computer technology. They wish to view the technology from a "safe distance". If this is true, then it is probably inappropriate to design an experience which requires stage one faculty to directly interact with computer technology. Hands-on computer workshops may serve to alienate rather than enamor. A more apparopriate "first encounter" with computer technology may very well involve one or more vicarious experiences which can be participated in without making a personal commitment to directly encounter the technology. Newsletters, topical discussions, and video tapes about computer technology have been well received. Faculty can leaf through newsletters, drop in on discussions, and view video tapes with the detachment characteristic of stage one individuals. Only after stage one concerns are sufficiently addressed will the individual be ready to participate in and benefit from more direct encounters with computer technology.

The content of these vicarious communications can sometimes be totally controlled as in the case of an in-house newsletter, video tapes, films, and slide presentations. Or the communications can be somewhat open, such as a planned discussion. We have learned to set content sophistication parameters on our faculty discussions and workshops, especially those planned for stage one individuals. Whatever the context and level of concerns, the model serves as a place for tally marks, helping insure that all functional cells are being addressed.

The next intervention strategy to be discussed cuts across contexts and, to a certain extent, concerns. One of the primary roles of the FDIC project has been to discriminate information about computer technology. As just described, the model can serve as a score card for recording broadcast information. However, much of the information discriminated by the project is selectively targeted to individual faculty members based on their self-identified areas of interest. For example, a "current literature clearing house" has been established to help meet the information needs of faculty. A faculty member identifies which area(s) he/she would like current information about. On a weekly basis, readers look through current journals which deal primarily with computer technology. If an article is found which seems to match up with an individual's interest area, the first page of the article is photocopied and sent to the faculty member along with a note which includes the complete bibliographic citation so that the entire article can be read if it appears to be interesting. Not only does the clearing house operation provide information about computer technology, it also serves to acquaint faculty with publications they might not normally encounter. The clearing house operation has been very well received; faculty members requesting the service appreciate the individual attention and some are starting to respond in kind by routing computer related articles they

find in their professional journals to their colleagues. This is a welcome indicator that this component of the project will continue after the project itself has ceased to operate.

As, I am sure, you have begun to sense, a key attribute of the FDIC Model is the emphasis placed on the individual. Consistent with this emphasis is an intervention that has generated considerable good will for the project. This intervention to is individual consulting with faculty. Specifically, the FDIC Project provides a consulting and training service for faculty wishing direct, individual assistance related to computer utilization.

For example, the Project has a graduate assistant whose primary task is to provide one-on-one help on a myriad of computer related topics. The topics have ranged in sophistication from "Help me make this Apple work" to "Show me how to use this statistical package." Some of these one-on-one consultations have resulted from a direct request from an individual faculty member. Others have resulted from simply approaching an individual and asking if he/she would be interested in examining a particular package or trying a different approach to dealing with a reoccurring situation. Often times the individual who is approached might be classified as a "change resister". If we have done our homework and know the individual's level of concern and their area(s) of technology needs, our approaches are typically accepted. In the last few months we have started to see our initial efforts at one-on-one interventions pay off; our early contacts are starting to refer other faculty members to the project. Also, we are beginning to see informal support networks being established among faculty, helping distribute the responsibility for faculty development beyond the FDIC Project. Such networks are also indicators that faculty concerns for collaboration are beginning to emerge and must be supported.

PROJECT EVALUATION

Each of the intentional interventions used in the FDIC Project are individually assessed to estimate their effectiveness. For example, following distribution of the first newsletter, a 10% sample was drawn and surveyed by phone. Approximately half of those surveyed (including the Dean of the college) could not remember having received a newsletter. This information led to a series of design changes in the newsletter's appearance. As mentioned earlier, the newsletter includes a pull out "direct response" form faculty can use to request information and/or assistance on a variety of computer related topics. The number of returned forms is another indication of the newsletters effectiveness at introducing new, personally relevant ideas to faculty. Our design changes appear to have taken care of the visibility problem early issues encountered. Most faculty are aware of the newsletter and some are beginning to make verbal reference to various articles and announcements.

The effectiveness of the current literature clearing house is indicated in two ways. First, by the number of faculty initially requesting the service. In departments where the clearing house has been made available, approximately 60% of the faculty have requested the service. A second effectiveness indicator for the clearing house is in the percentage of faculty wishing that the service be continued. Among faculty using the service, for more than 2 months, 80% have requested the service be continued. A more valid but harder to obtain measure would be to monitor how many of the clearing house mailings resulted in a faculty member seeking out an article in its entirety. At this time this information is not available except on a very selective basis and so offers no clues to the effectiveness of this particular intervention.

The effectiveness of the one-on-one consulting service is difficult to assess, especially in light of the fact that this service has only been available

for five months. We are using two indicators to gauge the effectiveness of this intervention:

1. number of faculty contacts.

2. number of requests for additional help following initial contact.

Our intent is to initially increase numbers in each of these categories during the first year of the project. Our goal is to reach 100 faculty members through one-on-one consulting, with 75% of these resulting in a second, follow-up contact. In the first five months over 50 faculty members were consulted with and 70% have requested additional contact. However, our long term goal is to gradually reduce these numbers, not by withdrawing support and services but rather by linking faculty to readily available resources and by developing in faculty the essential abilities required to solve many of their own computer related problems.

The evaluation of each intervention leads to the temptation to evaluate the effectiveness of the project and the validity of the model by simply lumping all indicators of all interventions together and using this sum as an indicator of the projects success. However, we are not certain that the sum of the parts equals the whole of the project. Thus, our plans for project evaluation are, in part, based on the effectiveness of the individual interventions and, in part, on the project model. Again, the emphasis is placed on the individual. If the project has been successful, three conditions should exist.

First, individuals will be at higher stages along the concerns dimension, especially those most frequently reached by the project interventions, than they were prior to the project. While the project is still in the formative stages, initial indications are that such movement is taking place.

Second, individuals will be involved in more computer related activities and will use computer technology more. This information will be gathered by using a structured interview technique developed as a part of the CBAM. No data

regarding use has been collected as yet. Computer related activity will also be informally assessed on the group level; project effectiveness would be indicated by an increasing number of groups involved in, or using computer technology. On the department and college level, increased support for computing activities would indicate project effectiveness.

Beyond assessing the projects effectiveness, the model itself must also be evaluated. During the project, the model must continue to perform the functions mentioned earlier. While all cells of the model are not yet functional, we have found the model to be an effective aid in designing, monitoring, and recording interventions. The dimension causing the greatest difficulty is the organizational dimension. Cells on the department and college level have not yet become fully functional. This may be a fault in the model's design or it may be an indicator that there is little commitment or involvement related to academic computing on these levels of organization.

Model evaluation activities are not limited to this particular application. We are in the initial stages of using the model to design and monitor another development effort in the area of computer technology. This application is not a higher education faculty development effort but rather an inservice effort for teachers, teacher aides, and support personnel through an area education agency. While the specifics of the organization and context dimensions are different, the dynamics of the model in this application are similar to those found in our faculty development project.

A final test of the model is to use the model with another innovation, another faculty development effort. The innovation has not yet been identified which will serve as the content for this test and no information as to the generalizability of the model across innovations is available at this time. Should the model fail to function given a different innovation, the question

must be raised as to the overall worth of the model. It may very well be that the model is helpful only with innovations that have a wide range of application. If so, innovations of limited scope, such as specific instructional innovations, may be inappropriate for this model.

The ultimate test of the model lies in its utility as an aid for understanding and dealing with reality. We welcome helpful criticisms of the model and hope that we have provided you with a few tools for considering your own faculty development efforts.

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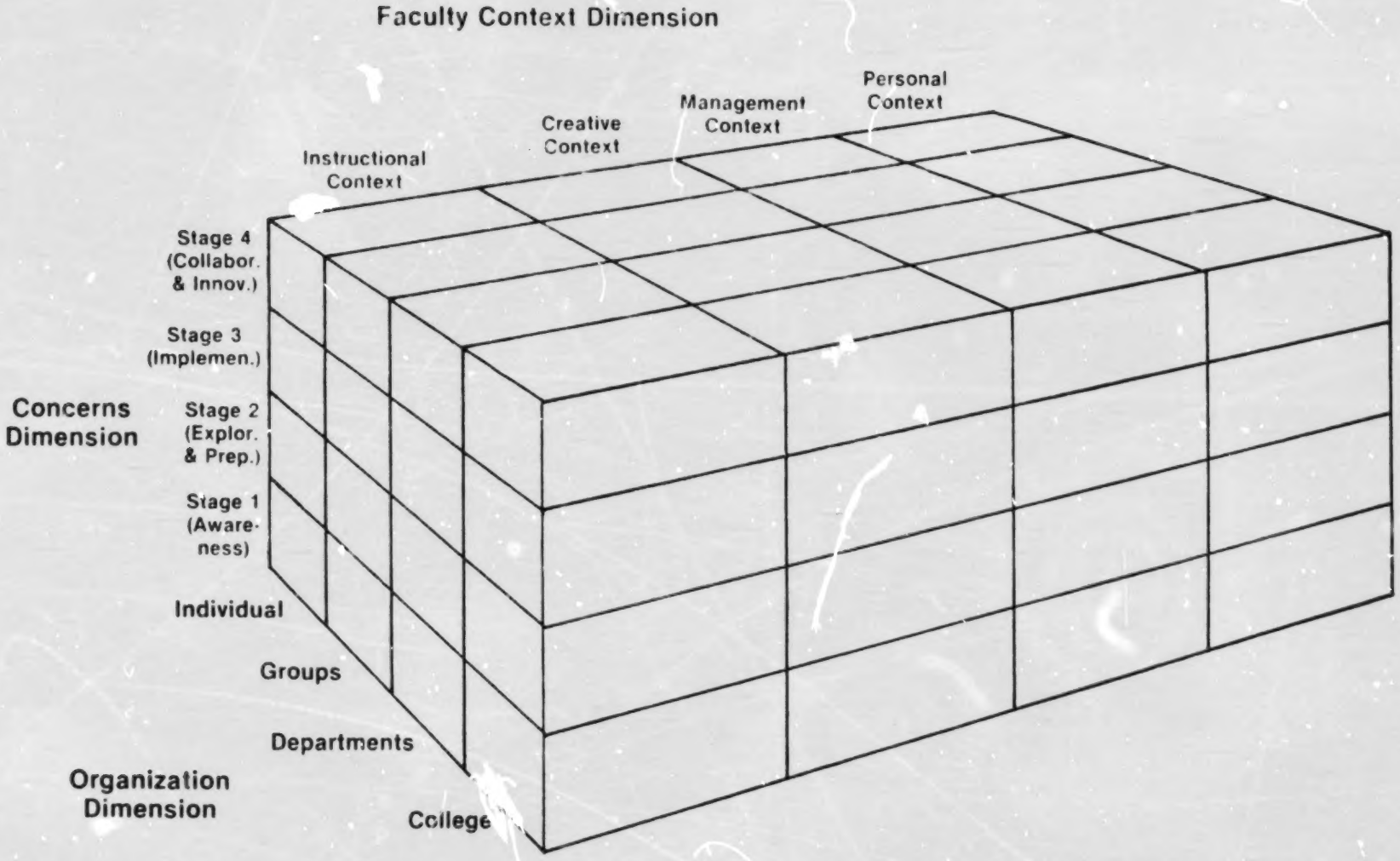

FDIC Project Model

Figure 1.

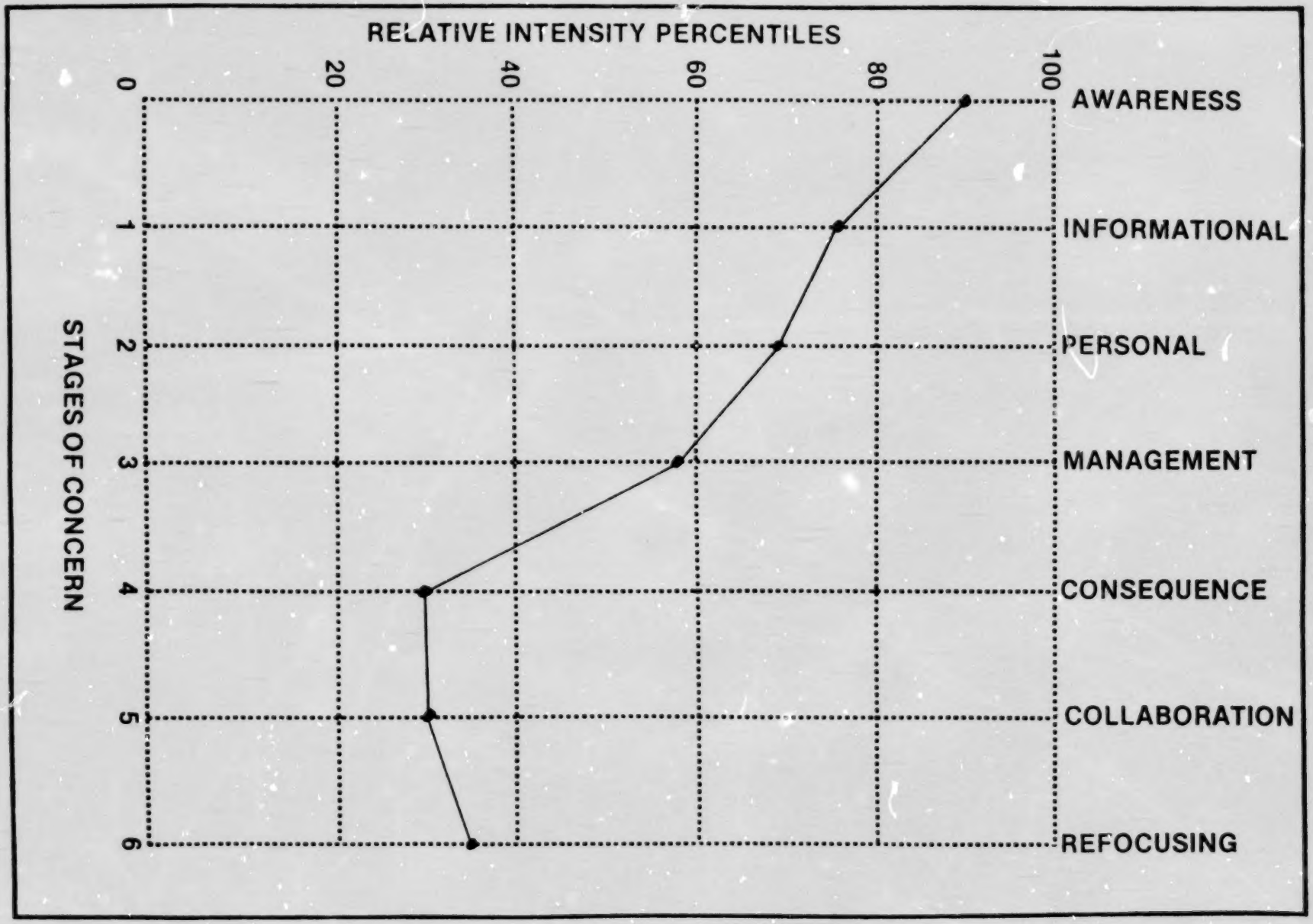

Figure 2. Concerns profile for group. (N=70)

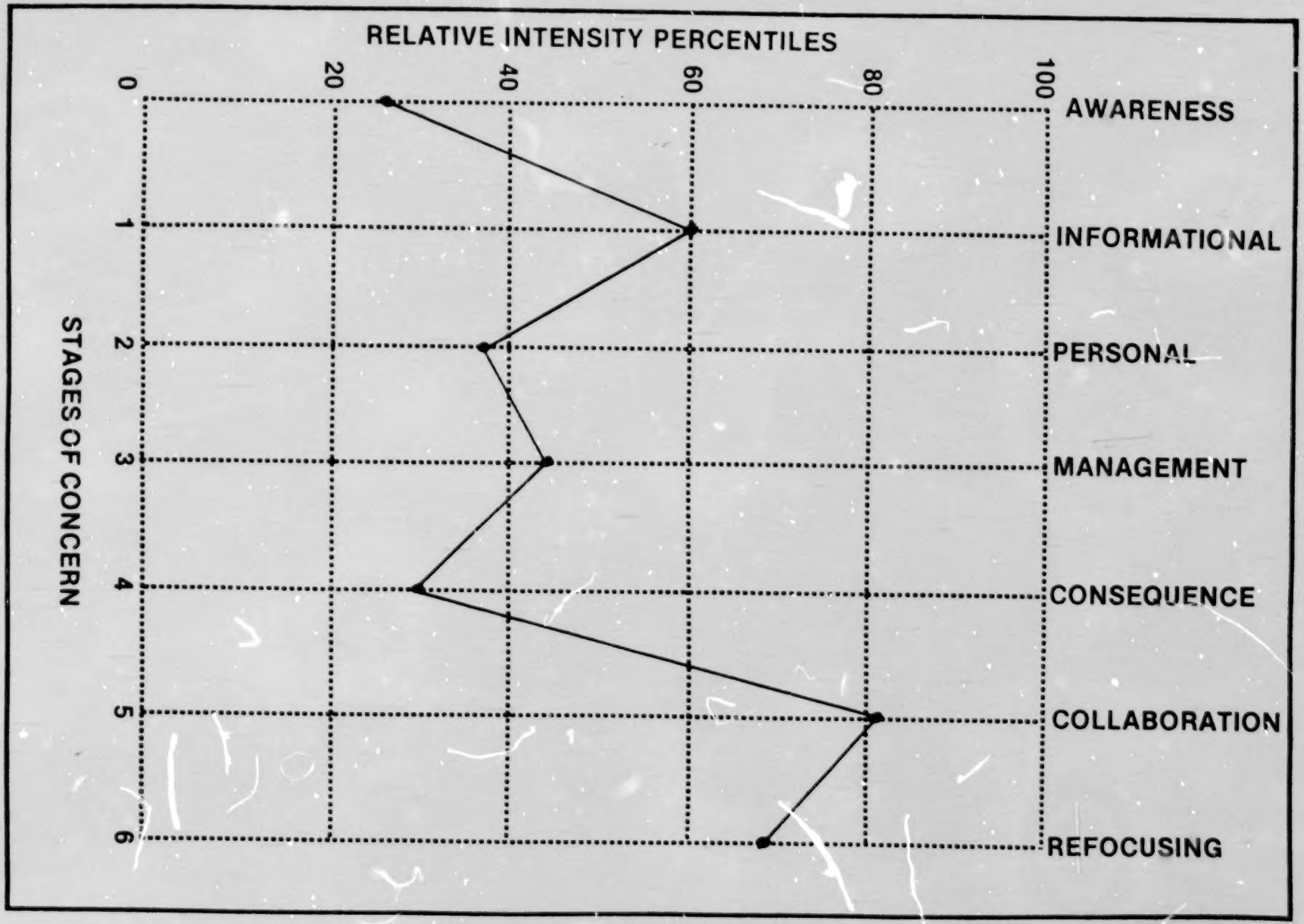

Figure 3. Concerns profile for experienced user.